

UNITED STATES PATENT APPLICATION
FOR
INTEGRATION OF STRUCTURAL AND COSMETIC BEZEL
FOR A SLOT LOADING OPTICAL DRIVE

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"Express Mail" mailing label number EV409361152US

Date of Deposit: March 10, 2004

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INTEGRATION OF STRUCTURAL AND COSMETIC BEZEL FOR A SLOT LOADING OPTICAL DRIVE

BACKGROUND

[0001] Aspects of the present invention include an optical drive bezel for an optical disk drive that includes integration of structural and cosmetic bezels for a slot loading optical drive.

[0002] A personal computer system may be thought of as a general-purpose, single-user microcomputer that is designed to be operated by a person. A small and low cost personal computer (PC) may include a monitor connected to a computer, each of which may receive power from an ordinary outlet. In operation, the monitor accepts video signals from a graphic card within the computer over a cable assembly and displays this information on a screen.

[0003] A computer system may include at least one optical disk drive configured to receive an optical disk such as a DVD or a CD disk for data processing. The optical disk drive is coupled to the motherboard of the computer system as is well known in the art. The optical disk drive is mounted in the computer system via a chassis that has an enclosure case. **Figure 1** shows a conventional way of mounting a slot loading optical disk drive 102 in a chassis 104 of a computer system (partially shown). The chassis 104 includes an enclosure 106 and a cosmetic piece 108 affixed to the enclosure 106. The cosmetic piece 108 includes a slot 110 to receive an optical disk 112. The optical disk 112 can be loaded into the optical drive 102 as is known in the art. The cosmetic piece 108 is not fixed to the optical drive 102 and there is no mechanical fastener directly between the cosmetic piece 108 and the optical drive 102. Thus, the cosmetic piece 108 can be decoupled or misaligned with the face of

the optical drive 102. The decoupling or misalignment possibility can cause reliability problems when inserting and/or ejecting the optical disk 112. For example, the optical disk 112 can be easily damaged during ejection or injection. Additionally, the optical disk 112 can be jammed during ejection or injection due to the misalignment thus causing installation failure.

[0004] **Figure 2** shows another conventional way of mounting a slot loading optical disk drive 102 in a chassis 104 of a computer system (not shown). The chassis 104 includes an enclosure 107 which also functions as a cosmetic piece. The enclosure 107 includes a slot 110 to receive an optical disk 112. The optical disk 112 can be loaded into the optical drive 102 as is known in the art. The enclosure 107 is not fixed to the optical drive 102 and there is no mechanical fastener directly connecting the enclosure 107 and the optical drive 102. A functional structure 111 having a slot 113 is coupled to the optical drive 102. The functional structure 111 provides some alignment mechanism for the optical disk 112 during injection and ejection. Misalignment of the slot 113 with the slot 110 is still a possibility depending on how the functional structure 111 is mounted in the chassis 104. The misalignment possibility can cause reliability problems when inserting and/or ejecting the optical disk 112.

SUMMARY OF THE INVENTION

[0005] An optical drive bezel assembly for coupling to an optical drive. The optical drive bezel assembly includes a functional bezel having a first opening to receive an optical disk and a first plurality of attachment features. The functional bezel is coupled to the optical drive. A disk guide is rigidly coupled to the functional bezel. A cosmetic bezel has a second opening to receive the optical disk and a second

plurality of attachment features. The cosmetic bezel is rigidly coupled to the functional bezel. A cosmetic screen is attached to the cosmetic bezel. The first opening and the second opening are in alignment.

[0006] In another embodiment, an optical disk drive assembly comprises an optical disk drive coupling to an optical drive bezel assembly, the optical drive bezel having a functional bezel rigidly attached to a cosmetic bezel, and a cosmetic screen disposed between the functional bezel and the cosmetic screen and fixedly attached to the cosmetic bezel, wherein a slot is provided in the optical drive bezel to allow an optical disk to pass therethrough.

[0007] In another embodiment, a computer system comprises a chassis or enclosure housing a computer system which has an optical drive. The optical drive is attached to the chassis or enclosure. A functional bezel having a first opening to receive an optical disk and a first plurality of attachment features is coupled to the optical drive and the chassis or enclosure. A disk guide is rigidly coupled to the functional bezel. A cosmetic bezel has a second opening to receive the optical disk and a second plurality of attachment features and is rigidly coupled to the functional bezel. A cosmetic screen is attached to the cosmetic bezel. The first opening and the second opening are in alignment.

BRIEF DESCRIPTION OF DRAWINGS

[0008] **Figure 1** illustrates a conventional way of mounting a slot loading optical disk drive in a computer system;

[0009] **Figure 2** illustrates another conventional way of mounting a slot loading optical disk drive in a computer system;

- [0010] **Figure 3** illustrates an exemplary optical disk drive assembly with an optical drive bezel in accordance to embodiments of the present invention;
- [0011] **Figure 4** illustrates a detail view of an exemplary optical drive bezel;
- [0012] **Figure 5** illustrates an exemplary embodiment of assembling the optical drive bezel to an optical drive;
- [0013] **Figures 6-7** illustrate an exemplary disk guide used with an optical drive;
- [0014] **Figures 8-10** illustrate three different views of a functional bezel of an optical drive bezel; and
- [0015] **Figures 11-12** illustrate two different views of a cosmetic bezel of an optical drive bezel.

DETAILED DESCRIPTION OF THE INVENTION

[0016] **Figure 3** illustrates an exemplary embodiment of an optical disk drive assembly 300. The optical disk drive 300 includes an optical disk drive 302 which is coupled to an optical drive bezel assembly 306. Embodiments of the present invention pertain to the configuration and integration of various parts of the optical drive bezel assembly 306. In one embodiment, the optical disk drive 302 is a slot loading optical disk that can accommodate at least one of a CD or a DVD disk. The optical disk drive 302 is also coupled to an electrical interconnect 304. In one embodiment, the electrical interconnect 304 is a flexible cable that provides an electrical interface of the optical disk drive to the motherboard of a computer system. The optical drive bezel assembly 306 includes a functional bezel rigidly attached to a cosmetic bezel, and a cosmetic screen disposed between the functional bezel and the cosmetic screen and fixedly attached to the cosmetic bezel (see below). A slot (not

shown here) is provided in the optical drive bezel assembly 306 to allow an optical disk to pass therethrough. The optical disk drive 302 is further coupled to a chassis bracket 308 to allow the optical disk drive 302 to mount to a chassis or enclosure. The chassis bracket 308 may also be mounted to the optical drive bezel assembly 306. The optical drive bezel assembly 306 thus can also provide a structural rigidity for the optical disk drive 302.

[0017] **Figure 4** illustrates an exemplary embodiment of the optical drive bezel assembly 306. One feature of the optical drive bezel assembly 306 is that all parts of the optical drive bezel assembly 306 are integrated as one unit before being attached to the optical disk drive 302. Misalignment is thus minimized or eliminated. The optical drive bezel assembly 306 includes a functional bezel 308 having a first opening 310 to receive an optical disk (not shown) and a first plurality of attachment features 312 and 314. The attachment features 312 are for attachment to the top side of the functional bezel 308 and the attachment features 314 are for attachment to the bottom side of the functional bezel 308. The optical drive bezel assembly 306 also includes a disk guide 341 rigidly coupled to the functional bezel 308. The disk guide 341 is clipped onto section 316 of the functional bezel 308 which is approximately the middle section of the functional bezel 308. The optical drive bezel assembly 306 also includes a cosmetic bezel 318 having a second opening 320 to receive the optical disk. The optical drive bezel assembly 306 includes a second plurality of attachment features (not shown in this view). The cosmetic bezel 318 is rigidly coupled to the functional bezel 308 through the attachment features. The first plurality of attachment features 312 and 314 are thus complimentary to the second plurality of attachment features. The optical drive bezel assembly 306 also includes a cosmetic screen 322 disposed between the functional bezel 308 and the cosmetic bezel 318. The cosmetic

screen 322 is fixedly attached to the cosmetic bezel 318. The functional bezel 308, the cosmetic bezel 318, and the cosmetic screen 322 are rigidly attached to each other such that the first opening 310 and the second opening 320 are in alignment.

[0018] **Figure 5** illustrates an exemplary embodiment of the optical drive bezel assembly 306 being coupled to the optical drive 302 and how these units can be attached to a chassis or enclosure of a computer system. The optical drive 302 is shown to be attached to the chassis bracket 308 which is attached to a chassis or enclosure (not shown) that houses the optical drive 302. The chassis bracket 308 includes a plurality of mounting mechanisms 324 which can be nuts and screws as is known in the art. The mounting mechanisms 324 allows for the mounting of the optical drive 302 to the chassis or enclosure. Normally, the optical drive is not easily removable by a user. In other words, the optical drive is normally fixed in place and is not designed to be removed by a simple sliding in/out procedure which is available on certain types of laptop computers (e.g., IBM's Thinkpads have "Ultrabays" which allow for easy inserting or removal of optical drives). The optical drive 302 is also shown to be attached to the electrical interconnect 304 and a back chassis bracket 326 through another set of mounting mechanism 328 (e.g., nuts and for screws). The optical drive bezel assembly 306 is attached to the chassis bracket 308 through a mounting mechanism 330. The optical drive bezel assembly 306 is attached to the optical drive 302 via a plurality of mounting points 334 provided on the optical drive bezel assembly 306 which are configured to be in alignment with a plurality of mounting points 332 on the optical drive 302.

[0019] In one embodiment, the functional bezel 308 provides a structural rigidity of the slot loading optical drive 302. The slot loading optical drive 302 can be one in a desktop format kind of computer or a portable computer (laptop or notebook

computer). Such computer system includes a chassis or enclosure that houses the computer system's motherboard and the optical drive 302 and the functional bezel 308 are mounted to chassis or enclosure. In addition, the functional bezel 308 also provides structural mounting points for the optical drive 302 to attach to the internal chassis or enclosure of the computer system. Additionally, the functional bezel 308 also provides attachment locations for the cosmetic bezel 318 as previously described.

[0020] In one embodiment, to prevent an optical disk from being scratched, jammed, or misaligned during injection or ejection, the disk guide 341 is installed on the functional bezel 308. In one embodiment the disk guide 341 is clipped onto the middle section 316 of the functional bezel 308. In one embodiment, the disk guide 341 is made of a lubricious plastic. The disk guide 341 also prevents the optical disk from getting stuck on the functional bezel 308 during ejection or on the cosmetic bezel 318 during injection. The disk guide 341 is configured so that it is tapered as shown in **Figures 6-7**. **Figure 6** illustrates a three dimensional view of the disk guide 341 and **Figure 7** illustrates a cross-sectional view of the disk guide 341. The disk guide 341 is tapered to ramp down toward the side 336 which will be the side that faces the optical drive 302 and to ramp up toward the external side 338 which will be the side that faces the cosmetic bezel 318. When an optical disk is inserted into the optical drive 302 through the optical drive bezel assembly 306, the optical disk is guided slightly downward toward the optical drive 302. The disk guide 341 thus guides the optical disk in a proper alignment into the optical drive 302. The optical disk is guided so that it is injected into the optical drive 302 below the top surface of the opening in the optical drive bezel assembly 306 and straight into the optical drive 302. This way, jamming or scratching the optical disk during injection is minimized.

The angle of the ramp down is configured so that the disk will be guided in a proper alignment into the optical drive 302.

[0021] When an optical disk is ejected from the optical drive 302 through the optical drive bezel assembly 306, the optical disk is guided slightly upward toward the opening 330 cosmetic bezel 318. The optical disk is guided so that it is ejected from the optical drive 302 above the bottom surface of the opening in the optical drive bezel assembly 306 and straight out of the optical drive 302. This way, jamming or scratching the optical disk during ejection is minimized. The angle of the ramp up is configured so that the disk will be guided out of the opening in the optical drive bezel 306 without jamming against the optical drive bezel assembly 306. In one embodiment, the ramp up may have an angle of approximately 8.5 degrees.

[0022] Returning to **Figures 8-10** illustrate the functional bezel 308 in more details the features that allow the functional bezel 308 to be rigidly attached to the cosmetic bezel 318 and the optical drive 302. **Figures 8-10** illustrate the functional bezel 308 in three different views, two different back views of the functional bezel 308 and a front view of the functional bezel 308.

[0023] **Figures 8 and 10** illustrate the front view of the functional bezel 308 showing two mounting holes 340 for mounting the functional bezel 308 to a computer system's chassis or enclosure. The functional bezel 308 may also include a plurality of threaded holes 344 which are used for mounting the functional bezel 308 to the chassis or enclosure. The functional bezel 308 may also include a tab 342 that can engage a slot provided on the optical drive 302 to provide additional fixture or attachment points. Also, the functional bezel 308 includes the mounting points 334, which could be tabs, created on the functional bezel 308. The mounting points 334 can engage or hook into the mounting points 361, which could be slots provided on

the optical drive 302 (**Figure 5**) to allow the functional bezel 308 to be attached to the optical drive.

[0024] **Figure 9** illustrates a plurality of alignment features such as attachment features 312, 314, and 346. The attachment features are located on the functional bezel 308 in accordance to the configuration and/or design of the cosmetic bezel 318. The attachment features are also alignment features that help align the functional bezel 308 and the cosmetic bezel 318 together properly for optimal attachment and integration. In one embodiment, the plurality of attachment features 312 provided on the functional bezel 308 are heat stake wells to allow the functional bezel 308 to be (adhered to mended via heat) to complimentary heat stake posts on the cosmetic bezel 318 (see below). The attachment features 312 provide top attachment points for the functional bezel 308 to the cosmetic bezel 318. It is to be appreciated that other attachment techniques can be used such as welding, using adhesive, and other mechanical attachment techniques. In one embodiment, the plurality of attachment features 314 provided on the functional bezel 308 are also heat stake wells to allow the functional bezel 308 to be adhered or mended via heat to complimentary heat stake posts on the cosmetic bezel 318. The attachment features 314 provide bottom attachment points for the functional bezel 308 to the cosmetic bezel 318. Additionally, the attachment features 346 on the functional bezel attach to recesses or mounting points 332 in the optical drive 302.

[0025] **Figure 11** illustrates the back view of the cosmetic bezel 318 and **Figure 12** illustrates the front view of the cosmetic bezel 318. From the back view, it can be seen that the cosmetic bezel 318 includes alignment features 350 which align with alignment features 352 provided on the functional bezel 308 (**Figures 8 and 10**). Additionally, the cosmetic bezel 318 also includes a plurality of attachment features

354, which in one embodiment are heat stake posts created on the cosmetic bezel 318. The attachment features 354 are complimentary to the attachment features 312. The attachment features 354 are positioned on the topside of the cosmetic bezel 318. In the embodiment where the attachment features 354 are heat stake posts and the attachment features 312 (on the functional bezel 308) are heat stake wells, the functional bezel 308 and the cosmetic bezel 318 are adhered to each other when heat is applied to the attachment features. The cosmetic bezel 318 also includes a plurality of attachment features 356 positioned at the bottom side of the cosmetic bezel 318. The attachment features 356 are complimentary to the attachment features 314 on the functional bezel 308. In the embodiment where the attachment features 356 are heat stake posts and the attachment features 314 are heat stake wells, the functional bezel 308 and the cosmetic features 318 are adhered to each other when heat is applied to the attachment features. It is to be appreciated that other techniques to attach the functional bezel 308 to the cosmetic bezel 318 can be used instead of heat staking. It is also to be anticipated that either the attachment features on the functional bezel 308 or the attachment features on the cosmetic bezel 318 can be the heat stake wells or the heat stake posts.

[0026] In one embodiment, the cosmetic bezel 318 also includes a plurality of mounting points 358 to mount the cosmetic bezel 318 to the chassis or enclosure of the computer system.

[0027] In one embodiment, the cosmetic bezel 318 includes a recess (not shown) for the cosmetic screen 322 to be attached thereto. The cosmetic screen 322 can be positioned in the recess and attached in a way that it is flushed against the cosmetic bezel 318. The cosmetic bezel 318 also includes alignment points 348 for alignment the cosmetic screen 322 with the cosmetic bezel 318. The cosmetic screen

322 includes alignment points 349 (**Figure 4**) which are to be aligned with alignment points 348 on the cosmetic bezel 318 for a proper attachment of the cosmetic screen 322 to the cosmetic bezel 318. The cosmetic screen 322 can be attached to the cosmetic bezel using adhesive, heat staking, or other suitable mechanical bonding techniques.

[0028] In one embodiment, the cosmetic screen 322 functions to prevent contaminants such as dust, particles, or the like to get into the optical drive 302. The cosmetic screen 322 also wipes the optical disk prior to or as it is being injected into the optical drive 302. The cosmetic screen may also provide EMF (Electromagnetic Field) shielding to prevent RF (Radio Frequency) energy which is generated within the chassis to leak outside of the chassis. The cosmetic screen 322 can be adjusted in thickness to control, for example, the contact friction induced on the optical disk during ejection, effectively controlling the ejection speed of the optical disk. In one embodiment, the cosmetic screen 322 is a composite of chamois adhesive and a polymer film such as Mylar (Mylar is a Trademark of Dupont). The Mylar is installed on the cosmetic screen 322 to help the installation of the cosmetic screen 322 onto the cosmetic bezel 318. The Mylar can provide some rigidity to the cosmetic screen 322 because without the Mylar, the cosmetic screen 322 is flimsy making it difficult to be properly aligned on the cosmetic bezel 318 for attachment. In one embodiment, the cosmetic screen 322 includes a slit 360 to allow the optical disk to be injected and ejected therethrough. The slit 360 is in alignment with the opening 310 of the functional bezel 308 and the opening 320 of the cosmetic bezel 318 to allow an optical dish to pass through. Incorporating the Mylar also helps keeping the slit 360 in the cosmetic screen 322 from becoming wavy when it is being installed onto the

cosmetic bezel 318. The cosmetic screen 322 can be made to match the aesthetic quality of the computer system chassis or enclosure.

[0029] In one embodiment, the opening 320 in the cosmetic bezel 318 is larger than the opening 310 in the functional bezel 308 to facility injection or ejection or the alignment of the optical disk into and out of the optical drive 302.

[0030] The exemplary embodiments described herein are provided merely to illustrate the principles of the invention and should not be construed as limiting the scope of the subject matter of the terms of the claimed invention. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense. Moreover, the principles of the invention may be applied to achieve the advantages described herein and to achieve other advantages or to satisfy other objectives, as well.